ONLINE SOCIAL NETWORKS AS A SOURCE AND SYMBOL OF STRESS: AN EMPIRICAL ANALYSIS

Completed Research Paper

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Abstract

This research examines the sources and consequences of stress when using online social networks (OSN). In a first step, the five OSN-induced stressors invasion, pattern, complexity, uncertainty, and disclosure are identified. In a second step, the Model of Continuous OSN Usage is developed in order to examine the influence of these five stressors. Therefore, the model is based on the Model of Adoption of Technology in Households and the Post-Acceptance Model. Results of an empirical analysis with 154 OSNs users reveal that 57 per cent of satisfaction and 64 per cent of continuous usage intention can be explained within the Model of Continuous OSN Usage. Notably, the five stressors have a higher strength of effect on satisfactions than the three attitudinal beliefs hedonic, utilitarian, and social outcomes altogether. In summary, the results offer a theoretical foundation for recent practical observations that OSNs are a source and symbol of stress.

Keywords: Online Social Networks, Stress, Continuous Usage, User Behavior, User Satisfaction, Scale Development, Structural Equation Modeling, Virtual Community, Stressors, Facebook

Introduction

Imagine a normal working day as a project manager full of minor daily hassles. Customers want to keep up-to-date regarding the current project status but one of the project employees cannot deliver the requested information easily, because the organization has implemented a new information system recently and she/he is not sufficiently trained to operate the system. While searching for this requested information herself/himself the project manager receives additional e-mails from other project employees with complaints about the new system. At the same time the mobile phone rings and the senior project manager calls saying that she/he expects the information system to become a success and justify the immense expenditure on it. In the end, the project manager feels stressed by all these technologies (e.g., information system, e-mail, mobile phone; Ayyagari et al. 2011; Barley et al. 2011). Because the project manager has no alternative but to use these technologies continuously in mandated settings (Brown et al. 2002), nobody can argue that feelings of strain will not occur (Ayyagari et al. 2011).

Nonetheless, similar observations have recently been made in the context of voluntary technology usage when using the online social network Facebook (Gartner 2011). This is somewhat surprising as online social networks (OSNs) are supposedly used to relax, to unwind after a stressful day, or to provide pleasure to users in a voluntary manner. While it might seem logical that a user would stop using an OSN when it becomes stressful, prior research focusing on voluntary technology usage in general or on OSNs in particular, has largely disregarded stressors and perceptions of stress. Hence, despite first indications that users stop using OSNs because they are stressed by this technology (Gartner 2011; Maier et al. 2012), there is an interesting research gap in technology usage and in online social network research in particular regarding whether voluntary technology can induce stress.

In order to provide a first step to close this research gap and to explain this phenomenon in more detail, this research intends to a) identify stressors in OSNs and b) to examine how OSN-induced stress has an impact on continuous OSN usage and how strong this effect is. Therefore, we develop an OSN-induced stress scale and combine these stressors and traditional perceptual beliefs theoretically with the renowned Post-Acceptance Model (Bhattacherjee 2001). Hence, our research questions are:

> *RQ1: What are the stressors when using online social networks?*
>
> *RQ2: How do stressors influence the continuous usage of online social networks and how strong is this effect compared to other perceptions?*

An empirical analysis based on 154 OSN users reveals five OSN-induced stressors (invasion, pattern, uncertainty, complexity, and disclosure) that, together with traditional perceptual beliefs, account for 57 per cent of satisfaction and 64 per cent of continuous usage intention. Notably, comparing the proposed to traditional theoretical models, the five identified stressors have higher impacts on satisfactions than attitudinal beliefs such as hedonic, utilitarian, and social outcomes altogether. The results thus offer a theoretical foundation to the practical observations of Gartner (2011) on OSNs and stress.

The remainder of this article is structured as follows. We next describe OSNs, the Post-Acceptance Model (Bhattacherjee 2001), and the Model of Adoption of Technology in Households (Venkatesh and Brown 2001). Based on this, we develop hypotheses and the Model of Continuous OSN Usage to then validate the OSN-induced stress scale and the model. Eventually, the results are critically discussed and summarized.

Theoretical Background and Hypotheses Development

To address the research questions, we provide some facts about OSNs in general and Facebook as the largest one in particular. Afterwards, we develop our research model based on the Post-Acceptance Model (Bhattacherjee 2001), the Model of Technologies in Household (Venkatesh and Brown 2001), and OSN-induced stress.

The Online Social Network Facebook

With almost 850 million users, Facebook represents the largest OSN, which are defined as web-based services enabling users to construct a profile, share connections with other users, and view lists of connections of others (Boyd and Ellison 2007). With their widespread diffusion, OSNs have become a

significant part of young individuals' lives and are used daily for several hours (Ellison et al. 2011). OSNs are used for social interactions with acquaintances to maintain friendships or to make new friends. Besides, users disclose details about themselves and hence provide plenty of information to their friends (Krasnova et al. 2010). OSNs can also replace both communication media, such as SMS, and communication patterns, for individuals coordinating events or private appointments via OSNs (Khan and Jarvenpaa 2010). Nonetheless, OSNs are not solely used for utilitarian purposes but also for providing pleasure by, for example, participating in virtual social online games or entertainment applications.

Despite these positive possibilities and the success of OSNs, there is an increasing suspicion that some individuals rethink their OSN usage behavior and intend to decrease usage as they become dissatisfied and stressed by OSNs (Krasnova et al. 2010; Gartner 2011). Hence, in the next sections we develop a Model of Continuous OSN Usage, which includes both positive beliefs, such as utilitarian and hedonic outcomes, as well as negative beliefs concerning OSN-induced stress.

Developing a Model of Continuous Online Social Network Usage

This section develops the Model of Continuous OSN Usage in order to research the influence of OSN-induced stress on continuous usage. Several other beliefs are also incorporated within this model in order to compare the effect of OSN-induced stress on continuous usage with the influence of other perceptual beliefs. Therefore, this model is based on several recent research articles, such as Post-Acceptance Model (Bhattacherjee 2001) and Model of Technology Adoption in Households (Venkatesh and Brown 2001).

The Underlying Model: The Post-Acceptance Model

In order to understand users' post acceptance behavior, Bhattacherjee (2001) bases his research on expectation-confirmation theory (Oliver 1980) and develops the Post-Acceptance Model (Figure 1). The model explains users' continuous usage by considering satisfaction as a major influencing factor. Satisfaction is in turn influenced by disconfirmation and perceptual beliefs. Disconfirmations reflect the subjective discrepancy between perceived expectations and perceived benefits and are negatively correlated with satisfactions (Lankton and McKnight 2012). Applied to OSNs, users whose expectations are not confirmed while using OSNs develop low levels of satisfactions. High levels of satisfaction with OSNs are in turn necessary in order to develop intentions of using OSNs continuously, so we aline with the Post-Acceptance Model (Bhattacherjee 2001) and assume that:

H1: The higher users' satisfaction the higher their continuous OSN usage intention.

H2: The higher users' disconfirmations the lower their satisfaction with OSNs.

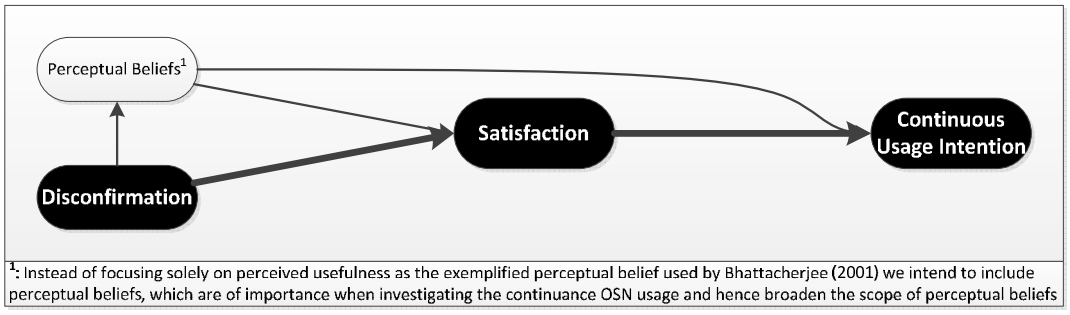

Figure 1. Post-Acceptance Model (Bhattacherjee 2001)

The Context-specific Model: The Model of Technology Adoption in Households

Perceptual beliefs represent the second factor influencing satisfactions in the Post-Acceptance Model (Bhattacherjee 2001). In more detail, solely perceived usefulness is included as antecedent of satisfaction and continuous usage intention in the Post-Acceptance Model, because it represents the most influential

belief in mandated usage settings (e.g., Brown et al. forthcoming). Nonetheless, when using technologies voluntarily, other beliefs are also of importance (Venkatesh and Brown 2001), so this research broadens the scope by incorporating additional beliefs which are considered when deciding whether or not OSNs are used continuously.

Therefore, we base our research on the Model of Adoption of Technology in Households (Figure 2, Venkatesh and Brown 2001), which discusses perceptual beliefs that are of importance for the decision regarding whether technologies, such as OSNs, are used in voluntary settings. This model explains individuals' behavior with the help of attitudinal beliefs, normative beliefs, and control beliefs. Attitudinal beliefs refer to the negative or positive evaluation of the outcomes of the behavior and subsume utilitarian outcomes, which represent the degree of effectiveness and utility, hedonic outcomes, which represent the degree of fun and pleasure, as well as social outcomes, which represent the degree of power, status and knowledge resulting from using a technology (Venkatesh and Brown 2001). Normative beliefs focus on the influence of friends, family, and acquaintances and are reflected in social influences. Control beliefs are factors, which subsume perceptions that stand in the way of using a technology continuously (Venkatesh and Brown 2001; Cenfetelli and Schwarz 2011). Here, perceived difficulty of use is identified as an inhibiting barrier determining whether or not individuals use technologies (Davis et al. 1989; Brown and Venkatesh 2005). Perceived difficulty of use represents the degree to which an individual perceives the usage of a technology as not being free from effort.

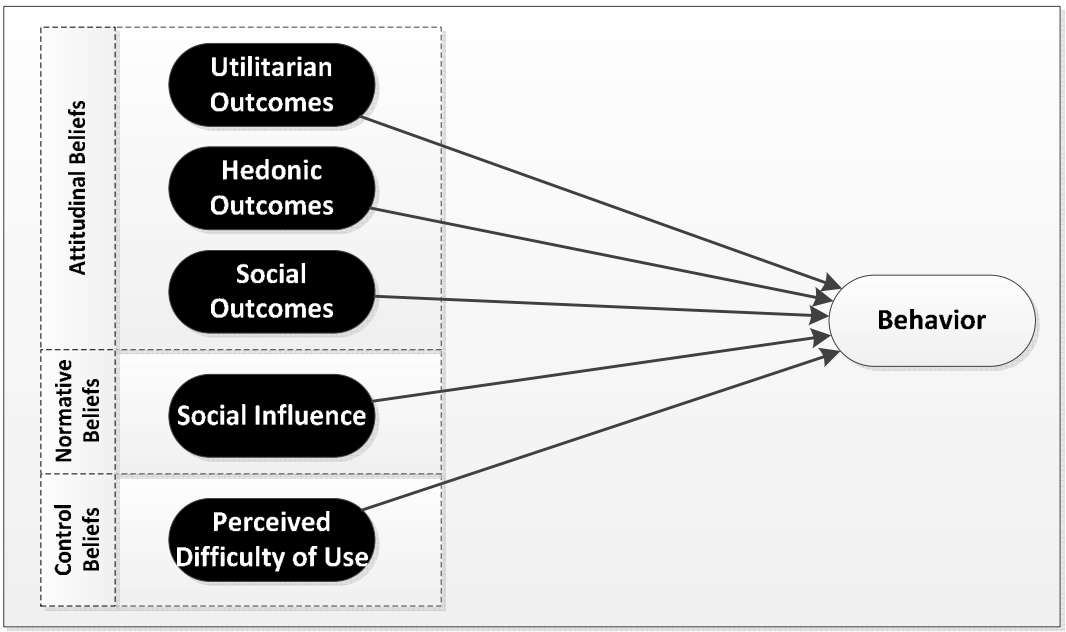

Figure 2. Model of Adoption of Technologies in Household (MATH; Venkatesh and Brown 2001)

These perceptual beliefs have been discussed in previous research in order to understand different sorts of technology-related behavior, such as technology adoption, non-adoption, and initial usage (Venkatesh and Brown 2001; Brown and Venkatesh 2005; Brown et al. 2006). Because these beliefs are also considered by users when deciding whether a technology is used continuously, they are included in the Model of Continuous OSN Usage to cover a wide range of different perceptual beliefs. We assume that these beliefs are of importance in continuous usage, because individuals are concerned about these beliefs when scrutinizing their own behavior and hence when they think about using OSNs continuously (Bhattacherjee 2001). Depending on these beliefs, individuals develop certain levels of satisfaction, and hence develop intentions to use OSNs continuously.

Concerning attitudinal beliefs, perceptions of high utilitarian, hedonic, and social outcomes will induce higher degrees of satisfactions (Bhattacherjee 2001; Thong et al. 2006; Lankton and McKnight 2012). In more detail, perceiving the usage of OSNs as useful for communicating or for staying in contact with

friends and acquaintances will increase the levels of satisfaction with OSNs and foster high intentions to use OSNs continuously. Besides, OSNs are widely used to provide pleasure to the user (Krasnova et al. 2010). Therefore, users play virtual online games or make use of applications. When these features provide pleasure, users are highly satisfied and will use OSNs with all their games, applications, and entertaining functions continuously. Social outcomes include the idea that OSNs are regarded as status symbols, which provide their users higher social standings. Among others, high numbers of virtual friends in OSNs can indicate that one enjoys high popularity or reputation (Kim and Lee 2011). Whenever reasons for using OSNs are grounded in these expectations, users will be highly satisfied when OSNs provide high social outcomes for their users. Hence, this will also increase intentions to use OSNs continuously. In summary, we hypothesize that the three dimensions of attitudinal beliefs have an influence on degrees of satisfactions and on continuous usage intentions (Bhattacherjee 2001):

> *H3: The higher users' utilitarian outcomes of OSNs, the higher a) their satisfactions and b) their continuous usage intentions.*
>
> *H4: The higher users' hedonic outcomes of OSNs, the higher a) their satisfactions and b) their continuous usage intentions.*
>
> *H5: The higher users' social outcomes of OSNs, the higher a) their satisfactions and b) their continuous usage intentions.*

For normative beliefs, an individual perceiving that family and friends support the usage of OSNs will be more satisfied (Roca et al. 2006), and hence continue using the technology (Liao et al. 2007). This means for OSNs that users are more satisfied with using OSNs when their family and friends support the usage. This results in feelings that one's own behavior is confirmed by others so that OSNs will be used continuously. On a negative side, when the social environment of an OSN user does not support the usage, the user has to explain herself regularly within her social environment. When no one of one's environment uses OSNs, it can also be the fact that one loses interest in using OSN because no one she knows uses it. Consequently, the user becomes less satisfied with using OSNs and might discontinue the usage. Because of this, we hypothesize that:

> *H6: The higher users' perceived social influence to use OSNs, the higher a) their satisfactions and b) their continuous usage intentions.*

Concerning the potential usage barrier of perceived difficulty of use (Venkatesh and Brown 2001), a user, who is not able to use the technology, will have lower satisfactions and lower intentions to use the technology in the future than a user who is able to use the technology effectively and efficiently (Thong et al. 2006; Liao et al. 2007). Applied to the context of OSN, difficulties with the usage of OSNs induce feelings of dissatisfaction and increase probabilities of using OSN much less in future. Thus, we assume:

> *H7: The higher users' perceived difficulty of use OSN, the lower a) their satisfactions and b) their continuous usage intentions.*

Online Social Network-induced Stress

Technology-induced stress has been recently discussed in the context of work-related tasks (Ragu-Nathan et al. 2008; Tarafdar et al. 2010; Ayyagari et al. 2011). A first article discussing technology-induced stress from a general perspective identifies technology usage as stressor (Ragu-Nathan et al. 2008). It is theorized that technologies create stress because technologies are an element of uncertainty and complexity, force employees to work more and faster, invade employees' personal life, and are the source of fears of being replaced. A second article theorizes that technology characteristics have an effect on technology-related stressors, which in turn are the source of feeling drained from activities that require the individual to use technologies at work (Ayyagari et al. 2011). Next to these articles discussing technology-induced stress from a general point of view, some articles focus on particular technologies. Among others, Mazmanian et al. (2005) identify smartphone usage as a source of stress. This is particularly due to the fact that e-mails, which are checked frequently on smartphones, blur boundaries between work life and social life (Middelton and Cukier 2006; Barley et al. 2011).

In these articles, researchers identify technology-related stressors and hypothesize psychological as well as behavioral reactions, in terms of decreasing levels of satisfaction, productivity or increasing turnover intentions (Ragu-Nathan et al. 2008; Tarafdar et al. 2010; Ayyagari et al. 2011). Because of recent

practical observations by Gartner (2011) documenting that individuals feel stressed and strained while using OSNs, we include stress in the proposed research model. For this, stressors are regarded as control belief, because they represent factors reducing the willingness to use OSNs continuously (Venkatesh and Brown 2001; Cenfetelli and Schwarz 2011; Maier et al. 2012).

While incorporating perceptions of OSN-induced stress into the Model of OSN-induced stress, we align with recent research assuming an influence of stressors on psychological and behavioral variables (Tarafdar et al. 2010). When being stressed while using OSNs, we assume that users become increasingly dissatisfied and rethink whether they intend to use OSNs continuously, so that we hypothesize that:

> *H8: The higher the OSN-induced stress, the lower a) their satisfactions and b) their continuous usage intentions.*

Within this section, we generally hypothesized the influence of OSN-induced stress (see research model in Figure 3). Afterwards we develop the structure and the sub-dimensions, in terms of stressors, of OSN-induced stress. As this is a central part of this article, it is described in detail within the following section.

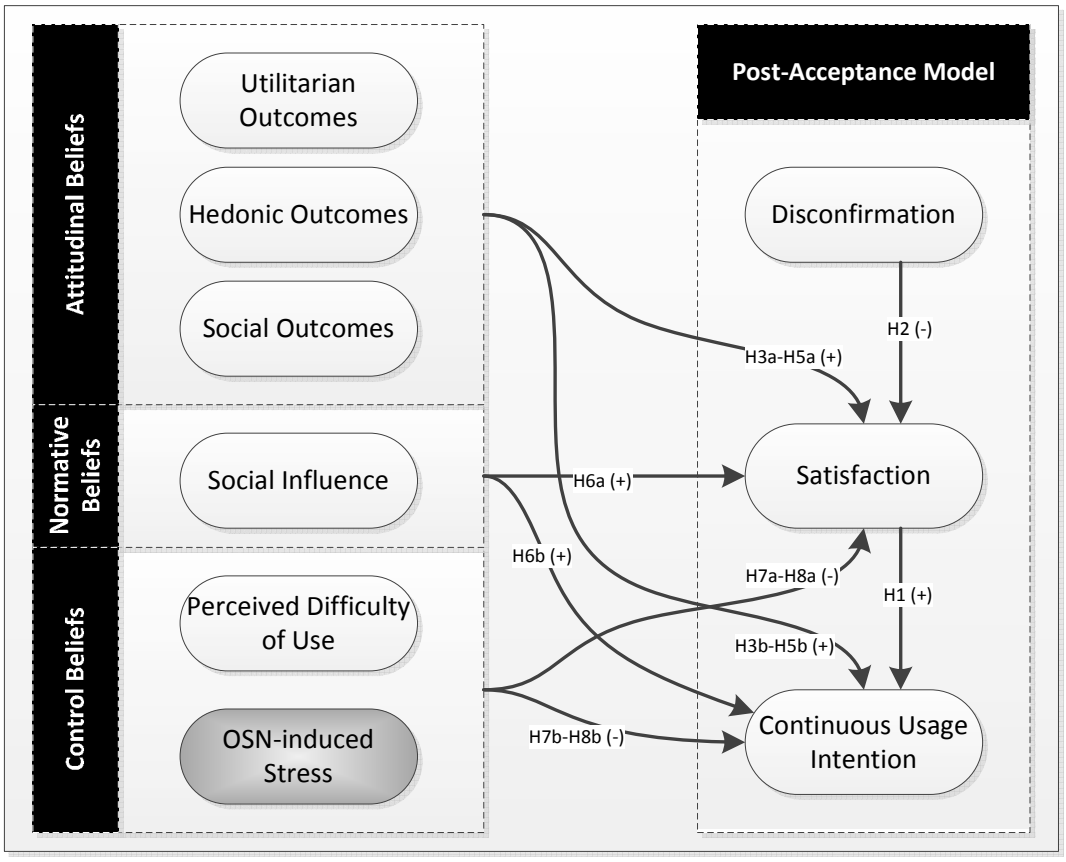

Figure 3. Research Model: Model of Continuous OSN Usage

Scale Development and Validation of OSN-induced Stress

In this section, we develop and validate a scale for OSN-induced stress in six steps (develop a pool of items, factor analyses, assess reliability and construct validity, construct reliability, discriminant validity, evaluation of second-order construct).

Step 1: Item Development of the Scale OSN-induced Stress

Starting with the scanning of recent articles[1] discussing stressors or the usage of OSNs, we identified potential OSN-induced stressors (e.g., information disclosure; Krasnova et al. 2010) in order to develop a first set of items for the proposed OSN-induced stress scale. Moreover, we interviewed twelve users of OSN, who were selected to reflect users of OSNs in a representative manner. This means that about 75 per cent of the interview partners should be younger than 35 years, because this corresponds to the age distribution of the largest OSN, Facebook, and because the same number of men and women are registered in this OSN we interviewed six men and six women (Table 1)[2]. The interviews were designed to a) find out whether individuals were stressed by the reasons identified within the literature and b) to identify further stressors when using OSNs. Based on these two steps, we collected a pool of items. These items were revised based on a discussion with the twelve interview partners to ensure content quality. These steps go in line with methods that have been used in prior research developing new scales (e.g., Chin et al. 1997; Salisbury et al. 2002; Ragu-Nathan et al. 2008).

Table 1. Demographics of the twelve interview partners

Demographics							
Gender		Age					
Men	Women	13-17	18-25	26-34	35-44	45-54	55-65
6	6	2	3	3	2	1	1

Step 2: Exploratory and Confirmatory Factor Analysis

For this step, an online survey was created, which included the final pool of items of step 1. In order to collect data, 1,800 e-mails were sent out to individuals, who had provided us with their e-mail addresses in previous surveys and given us permission to contact them when carrying out a new survey. Based on these mail-outs, 571 individuals completed all items of the survey on a 7-point-Likert scale (1 = totally disagree; 7 = totally agree) without missing values (response rate = 31.7%).

To run exploratory and confirmatory factor analysis while developing new scales, recent research suggests splitting the data set randomly into two subsamples (e.g., Ragu-Nathan et al. 2008). Hence, we split the data set into a set 1, consisting of 451 cases, and a set 2, consisting of 120 cases. Set 1 was used to develop the constructs, whereby set 2 was used to validate the results of set 1 and hence represents a holdout sample. These two partitioned data sets were the basis for performing exploratory and confirmatory factor analyses.

In a first step, set 1 was used to perform an exploratory factor analysis. Results reveal a five-factor structure, whereby four items had to be removed. These results are included in the attached appendix.

In a second step, set 1 was used again to perform a confirmatory factor analysis with AMOS 20. In this step, we deleted items with high correlations among their error terms. Hence, one item had to be removed (C-1). This result is also provided when using set 2 (N_2=120). The final structure of the OSN-induced stress scale is shown in Table 2 and explained in more detail thereafter.

[1] We scanned the Senior Scholars' Basket of Journals with its eight journals (MISQ, ISR, JMIS, JAIS, EJIS, ISJ, JSIS, and JIT) for the period 2002-2012. Therefore, 32 stress- and OSN-related search terms have been used. For the identified articles, we performed forward and backward search as proposed by Webster and Watson (2002) in order to identify all articles.

[2] see for example http://www.kenburbary.com/2011/03/facebook-demographics-revisited-2011-statistics-2/

Table 2. Mean, Standard Deviation, Alpha-Reliability and Measurement Items of OSN-induced stress

Construct		Items / Measurement	Mean	S.D.	Reliability
OSN-Pattern	P-1	Through OSNs, I am forced to inform friends about news prompt.	2.89	1.47	0.87
	P-2	Through OSNs, I am forced to communicate with friends periodically.			
	P-3	I am forced to adapt my communication patterns to OSN.			
OSN-Invasion	V-2	I have to be in touch with OSN even during my vacation due to OSNs.	3.87	1.70	0.87
	V-3	I have to sacrifice my vacation and weekend time to use OSNs.			
	V-4	I feel my personal life is being invaded by OSNs.			
OSN-Complexity	C-2	I need a long time to understand and use new technologies as OSNs.	2.58	1.27	0.82
	C-3	I do not find enough time to upgrade my technology skills to use OSNs.			
	C-4	I find younger people know more about OSNs than I do.			
	C-5	I often find it too complex for me to use OSNs.			
OSN-Disclosure	I-1	I feel constant threat to my social status due to OSNs.	2.52	1.33	0.84
	I-3	I perceive pressure through my friends, to check their news on OSNs regularly.			
	I-4	I do not share all of my news on OSNs, so that I am better informed than my friends.			
	I-5	I think that my friends do not post all their news in OSNs, as they wants to be informed best.			
OSN-Uncertainty	U-1	There are always new terms and conditions in OSNs.	4.76	1.24	0.85
	U-2	There are constant changes in applications of OSNs.			
	U-3	Overall, there are constant changes in OSNs.			

As a consequence of these two steps and the resulting structure, we analyzed the contents of the summarized items in order to name and define the resulting five stressors, as suggested by Ragu-Nathan et al. 2008. Based on the content of the items, the five stressors are named: OSN-pattern, OSN-invasion, OSN-complexity, OSN-disclosure, and OSN-uncertainty. Here, OSN-pattern is perceived as stressor in OSNs when individuals are forced to adapt all their behavioral patterns to the pattern of OSN. For example, individuals have reported during our interviews that they feel stressed because OSNs are increasingly used as the predominant technological medium for communication. Hence individuals have to change their habitual behavioral pattern, whereby behavioral changes depict often a source of stress (Polites and Karahanna 2012). Such OSN-induced changed behavioral patterns can be seen in recent research reporting the usage of OSNs for the purpose to coordinate events (Khan and Jarvenpaa 2010). The stressor invasion in the context of OSNs occurs in situations in which OSNs become an integral part of everyday life. Most of OSN users are online for more than one hour daily (Ellison et al. 2011). Complexity is perceived as stressor, when OSNs are perceived as difficult to handle and an individual feels unable to use it easily. Apart from that, uncertainty refers to the situation that users are stressed due to changes in OSNs. Such changes are observed recently, while among others the OSN Facebook has introduced the timeline format to Facebook profiles. The last stressor is termed disclosure and concentrates on the information that is disclosed on OSNs by oneself as well as one's virtual OSN friends. Here, users perceive that they are being forced to disclose information about themselves as well as check the latest news about others in order to be up-to-date regarding their social status (Krasnova et al. 2010). As a consequence of all the information that is being exchanged users report feeling stressed.

Step 3: Assessing Reliability and Construct Validity of the new Items

In a third step, we intended to assess the reliability and construct validity of the new items. Therefore we used the procedure suggested in prior research (Landis and Koch 1977; Nahm et al. 2002). We asked individuals to assign each newly developed item to one of the identified stressors. In order to collect data, we again set up an online survey and sent out e-mails to 200 individuals, who did not participate in the survey for step 2. In the end, 57 individuals assigned each item of step 3 to one of the identified OSN-induced stressors. The procedure of this step was as follows. We presented and defined the five stressors to each participant. Then, we provided two examples to the participants that explained how individuals should assign items to stressors. Afterwards, each participant read each item and assigned it to one of the five OSN-induced stressors (invasion, pattern, complexity, uncertainty, disclosure) or an additional field which meant that the participant cannot definitely assign it to one stressor clearly. This procedure was repeated for each item. Based on the answers of all 57 responses, we calculated ratios to which participants matched questions to the stressor, which was – according to exploratory factor analysis – the

correct higher-order stressor. As suggested in prior research (Landis and Koch 1977; Nahm et al. 2002), we rejected all questions which were assigned correctly by less than 61 per cent. Results are included within the appendix and indicate that no item has to be removed. In summary, step 2 summarized all items, which belong statistically together and this step focused on semantically coherence.

Step 4: Construct Reliability

We provide means, standard deviation, and reliability, in Table 2 to ensure the construct reliability of the five OSN-induced stressors. The base for this calculation was the combined data sample of set 1 and set 2, consisting of 571 cases (see step 2). For each OSN-induced stressor, cronbach's alpha values were greater than the recommended minimal threshold of 0.7 (Nunnally and Bernstein 1994, Hair 1995; see Table 2: Reliability).

Step 5: Discriminant Validity of the Conceptual Model through a First-Order Correlated Measurement Model of all Constructs

Within this step, we again made use of the complete data sample of step 2, consisting of 571 cases. Using this set, discriminant and convergent validity was examined. Hence, a first order correlated measurement model was run in AMOS 19 (see Model 1 in Table 3). Due to the fact that no significant error correlations among any items exist, discriminant and convergent validity are good.

Table 3. Discriminant Validity

Model		χ^2	df	χ^2/df	GFI	AGFI	NFI-δ1	SRMR	IFI-δ2	TLI-ρ2	CFI
Model 1	First-order correlated model	405	109	3.7	0.91	0.87	0.91	0.05	0.93	0.92	0.94
Model 2	Facebook-induced stress second order model	451	114	4.0	0.90	0.86	0.90	0.07	0.91	0.90	0.91

To evaluate the first-order correlated model, several indices were used. Here, χ^2/df is greater than one and smaller than five as recommended by prior research (Chin et al. 1997; Salisbury et al. 2002). The Goodness-of-Fit Index (GFI), which indicates the relative amount of variance and covariance that is explained by the model, exceed the threshold of 0.85 and the Adjusted Goodness-of-Fit Index (AGFI), which adjusts GFI for the degrees of freedom, exceeds the recommended threshold of 0.8 (Hair 1995; Hadjistavropoulos and Asmundson 1999) so that the model fits well. Normal Fit Index (NFI) and Comparative Fit Index (CFI) indicate the percentage enhancement in fit over the baseline model, whereby NFI should be greater than 0.8 (Hair 1995; Hadjistavropoulos and Asmundson 1999) or 0.9 (Salisbury et al. 2002) and CFI should be greater than 0.9 (Bentler and Bonett 1980; Salisbury et al. 2002), which is both fulfilled for the first-order correlated model. For the Standardized Root Mean Square Residual (SRMR), which represents the standardized difference between observed and predicted covariance, values less than 0.08 indicate acceptable fit (Hu and Bentler 1999). The incremental index of fit (IFI) is used to address the issue of parsimony and sample size and should be 0.9 and higher (Bollen 1989; Salisbury et al. 2002) and the recommended values of the Tucker-Lewis coefficient (TLI) are at least 0.90 (Salisbury et al. 2002). While developing new models, Vassend and Skrondal (1997) suggest considering more liberal values, so that the discriminant validity can be confirmed.

Step 6: Verification of Second-Order Construct for the five Stressors

In order to validate OSN-induced stress as a second-order construct, we compared the first-order correlated model with a second-order model (see model 2 in Table 3). Therefore, we again used the complete data sample of step 2 with 571 cases. Concerning the second-order model, Table 3 indicates that the recommended values were exceeded. To compare both models, prior research has used χ^2-values for the first-order model (model 1) and the second order model (model 2) in order to calculate the ratio (Ragu-Nathan et al. 2008). If this ratio was greater than 80 per cent, the evidence of a second order

construct would be verified (Marsh and Hocevar 1985). In our case the ratio is 89.8 per cent so that OSN-induced stress was considered as second-order construct with five stressors.

In more detail, OSN-induced stress is conceptualized as reflective construct due to the guidelines of Polites et al. (2012). Hence, it represents a reflective first-order, reflective second-order construct, so that the relationships flow from the construct to its five dimensions (Figure 4).

Validation of the Model of Continuous OSN Usage

After developing and validating the OSN-induced stress scale, we examine its effect within the proposed Model of Continuous OSN Usage. For this purpose, we need a data sample, which includes intentions to use OSN continuously, satisfaction, disconfirmation, and six perceptual beliefs including the OSN-induced stress. Hence, we set up an online survey and invited 500 individuals to take part. We raffled off digital cameras and GPSs among all the participants to motivate them to complete the survey without missing values. Because of the fact that we examine the continuous usage of OSNs, we only included current users into the data sample. Hence, some non-users had to be deleted. In the end, the data sample consists of 154 OSN users (response rate = 30.8%). The demographics of these participants as well as their extent of OSN usage are illustrated in Table 4.

Table 4. Demographics of the 154 participants

Demographics											
Gender	Men	40.9%	**Professional Occupation**	Pupil / Student	49.4%	**Frequency of Usage**	hourly	9.5%	**Number of Friends**	>350	8.5%
	Women	59.1%					several times a day	53.0%		301-350	9.6%
Age	<19	10.6%		Employed	47.4%		once a day	12.8%		251-300	8.7%
	19-24	41.1%					several times a week	12.6%		201-250	16.4%
	25-34	36.1%		retired person	0.6%		once a week	4.6%		151-200	19.6%
	35-44	8.6%					several times a month	3.7%		101-150	14.2%
	45-54	2.6%		seeking work	2.6%		once a month	3.9%		51-100	13.6%
	>54	1.0%								0-50	9.4%

Based on these data, we investigate the hypotheses of the Model of Continuous OSN Usage. To validate our hypotheses, we use the partial least squares (PLS) method and SmartPLS 2.0 M3 (Ringle et al. 2005), because of the relative small data sample as well as the robustness of PLS method.

Common Method Bias

Empirical research has to consider common method bias (CMB) in self-reported data (Podsakoff et al. 2003). For determining the extent of CMB, we run two distinct tests. The first one is the Harman's single factor test. This test indicates if the majority of the variance could be explained by one single factor. For our data, the test reveals that less than 50 per cent of the variance of all indicators is explained by one factor. In more detail, the single factor explains only 24.7 per cent. Additionally, we perform another statistical analysis. Here, we make use of our PLS model and include a CMB factor into the model (Williams et al. 2003). All remaining factors are transformed into several single-item constructs and the ratio of R^2 with CMB factor to R^2 without CMB factor is compared. The CMB factor explains an average delta R^2 of 0.005 in our model. Without CMB factor, the average R^2 is 0.609. This indicates a ratio of 1:121 so that we cannot observe signs of CMB influence (Liang et al. 2007).

Measurement Model

As attitudinal, normative, and control beliefs are all measured by reflective indicators, content validity, indicator reliability, construct reliability, and discriminant validity need to be observed to validate our measurement model (Bagozzi 1979).

Content Validity

To ensure content validity, we transfer items, which have been used in prior articles, to our research context whenever possible. The specific measurement items are provided in the appendix.

Attitudinal Beliefs. The three attitudinal beliefs *utilitarian* (α=0.83), *hedonic* (α=0.86), and *social outcomes* (α=0.89) are adopted from Venkatesh and Brown (2001) as well as Brown and Venkatesh (2005) and modified to fit our research context. All three constructs are operationalized with three items and a 7-point-Likert scale (1 = totally disagree; 7 = totally agree).

Normative Beliefs. As suggested by Brown and Venkatesh (2005), normative beliefs are measured with the influences of individuals in one's social environment. Thus, we make use of a 7-point-Likert scale and the items proposed by Brown and Venkatesh (2005) to capture *social influence* (α=0.95).

Control Beliefs. The three items of *perceived difficulty of use* have their origin in Davis et al.'s (1989) scale perceived ease of use. This scale was modified to focus the negative belief in terms of perceived difficulty of use. This is captured by a 7-point-Likert scale (1 = totally disagree; 7 = totally agree; α=0.94). In addition, the newly developed OSN-induced stress scale is used.

Disconfirmation, Satisfaction, Continuous Intention. In order to capture *continuous usage intention* (α=0.81), *disconfirmation* (α=0.83), and *satisfaction* (α=0.89) we make use of the scales used by Bhattacherjee (2001) and a 7-point-Likert scale (1 = totally disagree; 7 = totally agree).

Indicator Reliability

The indicator reliability specifies the rate of variance of an indicator that comes from the latent variables. In order to explain at least 50 per cent of the variance of a latent variable by the indicators, each value has to be greater than 0.707 (Carmines and Zeller 2008). Table 5 includes all loadings and shows that each loading exceeds the recommended threshold.

Construct Reliability

Construct reliability is investigated with the help of composite reliability (CR) and average variance extracted (AVE). The corresponding values are provided in Table 5. Both values are utilized to verify a high quality at the construct level (Fornell and Larcker 1981). Here, CR should be 0.7 or higher and AVE higher than 0.5. Both criteria are fulfilled.

Table 5. Mean and bivariate correlations

	Construct	Mean	# Items	Loadings	AVE	CR	1	2	3	4	5	6	7	8	9	10	11	12	13
1	Utilitarian Outcomes	5.55	3	0.835-0.893	0.75	0.90	0.864												
2	Hedonic Outcomes	3.44	3	0.876-0.913	0.80	0.92	0.49**	0.896											
3	Social Outcomes	2.80	3	0.884-0.943	0.81	0.93	0.18**	0.35**	0.901										
4	Social Influence	3.61	4	0.899-0.957	0.87	0.96	0.24**	0.13	0.58**	0.933									
5	Perceived Difficulty of Use	2.81	3	0.923-0.937	0.87	0.95	-0.39**	-0.31**	-0.06	-0.06	0.932								
6	OSN-pattern	2.88	3	0.875-0.922	0.80	0.92	0.18*	0.31**	0.53**	0.55**	-0.14	0.895							
7	OSN-invasion	3.83	3	0.869-0.913	0.81	0.93	0.48**	0.51**	0.36**	0.37**	-0.31**	0.48**	0.898						
8	OSN-complexity	2.61	4	0.847-0.976	0.84	0.96	-0.23**	-0.01	0.21*	0.07	0.49**	0.14	-0.13	0.919					
9	OSN-disclosure	2.46	4	0.820-0.894	0.72	0.91	0.04	0.20**	0.52**	0.44**	0.04	0.63**	0.31**	0.23**	0.847				
10	OSN-uncertanty	4.69	3	0.784-0.915	0.75	0.90	0.08	-0.09	0.12	0.27**	0.03	0.23**	0.26**	0.03	0.20*	0.863			
11	Disconfirmation	4.40	3	0.714-0.956	0.76	0.92	-0.34**	-0.29**	-0.07	0.01	0.57**	-0.03	-0.08	0.09	0.03	0.01	0.872		
12	Satisfaction	4.83	4	0.765-0.924	0.75	0.90	0.36**	0.37**	-0.25**	0.01	-0.31**	-0.39**	0.12	-0.19*	-0.56**	-0.24**	-0.28**	0.866	
13	Continuous Usage Intention	5.15	3	0.812-0.828	0.67	0.86	0.27**	0.15	-0.21**	0.03	-0.19	-0.47**	-0.01	-0.27**	-0.55**	-0.22**	-0.14	0.73**	0.818

Note: ** p < 0.01; * p < 0.05 Square Root of AVE is listed on the diagonal of bivariate correlations

Discriminant Validity

Discriminant validity describes the extent, to which measurement items differ from others (Campell and Fiske 1959). Table 5 contains the square root of AVE on the diagonal of latent variable correlation. This has to be greater than the corresponding construct correlations (Fornell and Larcker 1981; Hulland 1999). As this is also fulfilled, the entire measurement model is valid.

Structural Model

For evaluating the structural model, the coefficient of determination (R^2) and significance levels of each path coefficient are used (Chin 1998). Figure 4 indicates that attitudinal beliefs, normative beliefs, control

beliefs, and disconfirmations explain 57 per cent of satisfactions, and these beliefs explain together with satisfaction 64 per cent of continuous usage intention. Concerning the path coefficients, we can state that eight hypotheses are confirmed. In more detail, the two attitudinal beliefs, utilitarian and hedonic outcomes have a significant positive effect on continuous intention. In contrast to that, social outcomes as well as the normative belief social influence and have no influence on satisfaction. Perceived difficulty of use and OSN-induced stress has a significant effect on satisfaction. The hypothesis that disconfirmations are a significant contributing factor for satisfactions when using OSNs cannot be confirmed. Instead of this, utilitarian outcomes, social outcomes, and OSN-induced stress are identified as significant contributing factor for continuous usage intention. In summary, Hypotheses 1, 3a, 3b, 4a, 5b, 7a, 8a, and 8b are confirmed.

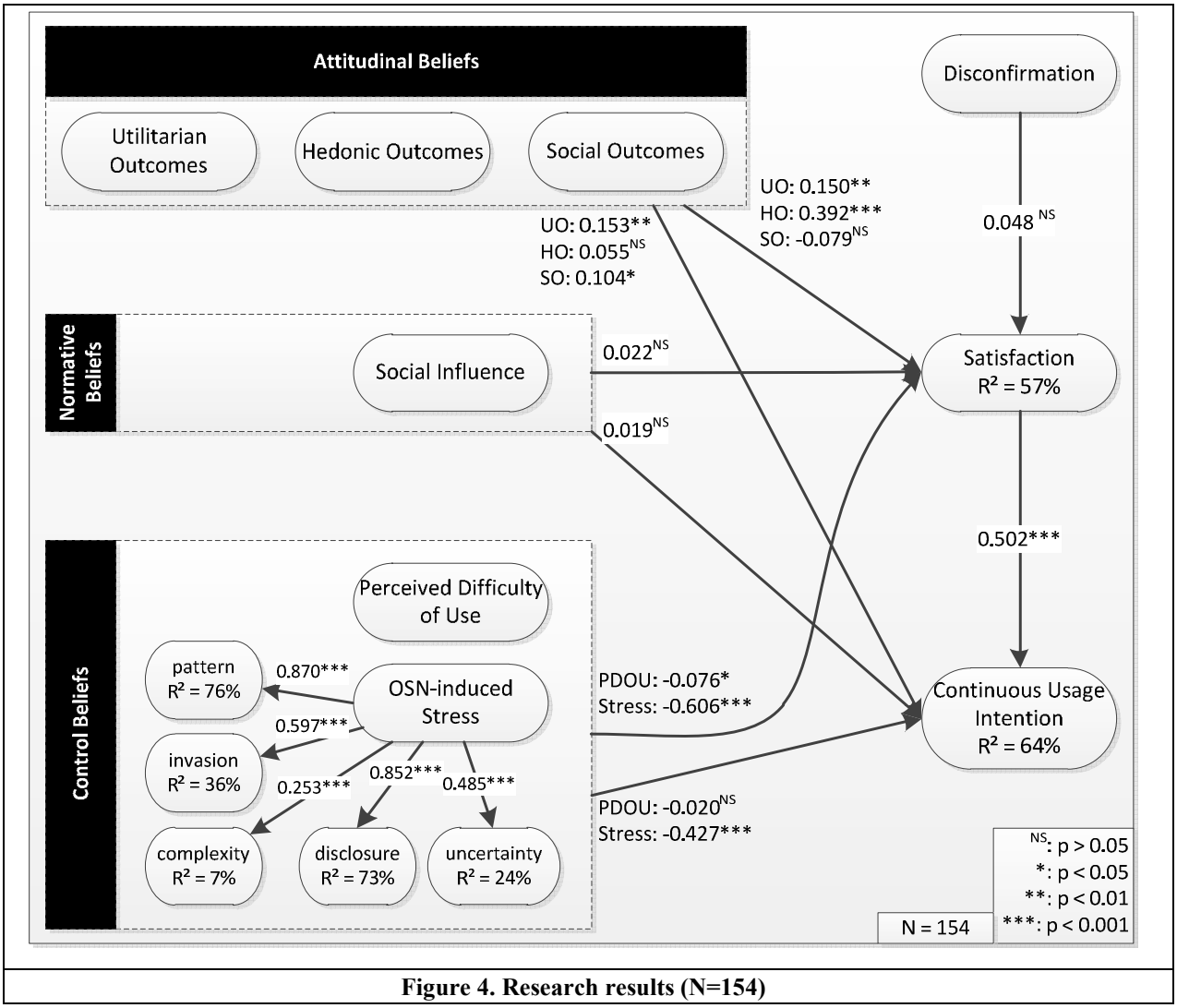

Figure 4. Research results (N=154)

In order to determine the strength of effect, f^2 values are calculated. Table 6 shows that the strength of effect of utilitarian outcomes, perceived difficulty of use, and disconfirmations on satisfaction is low. Hedonic outcomes have a medium effect size (Cohen 1988). For social outcomes and normative beliefs no effect has been observed, whereas the strength of effect of OSN-induced stress on satisfaction is high. When considering the strengths of the effects of the studied perceptions on continuous usage intention, Table 6 shows that utilitarian and social outcomes have a low effect, whereas OSN-induced stress and satisfaction have a medium strength of effect. In summary, OSN-induced stress has the largest effect on satisfaction, which in turn has the highest effect on continuous usage intention.

Table 6. The strength of effect (Cohen 1988)

independent variable	Attitudinal Beliefs				Normative Beliefs	Control Beliefs		Continuous Usage Intention	
	utilitarian outcomes	hedonic outcomes	social outcomes	utilitarian, hedonic, social outcomes	social influence	perceived difficulty of use	OSN-induced stress	dis-confirmation	satisfaction
dependent variable	**Satisfaction**								
f^2	0.03	0.18	0.01	0.38	0.01	0.02	0.41	0.03	--
Interpretation	low effect	medium effect	no effect	high effect	no effect	low effect	high effect	low effect	--
dependent variable	**Continous Usage Intention**								
f^2	0.03	0.01	0.03	0.08	0.00	0.00	0.27	--	0.33
Interpretation	low effect	no effect	low effect	low effect	no effect	no effect	medium effect	--	medium effect

Note: f^2 means effect size; Cohen (1988) interprets effect sizes as follows: > 0.35 = high effect; > 0.15 = medium effect; > 0.02 = low effect

Control Variables

To control for alternative explanations, we use demographic variables, such as age, gender, educational background, and context-related variables as the number of OSN-friends and the extent of OSN usage. Altogether, these five control variables explain only 0.004 (R^2=0.4%) of satisfaction and 0.007 (R^2 = 0.7%) of continuous usage intention. Besides, only one variable, namely extent of OSN usage, has a weak significant impact on continuous usage intention ($\beta = -0.09$; $p < 0.05$).

Discussion, Implications, and Future Research

Motivated by recent practical observations of Gartner (2011), whereupon users of OSNs feel stressed, this research identifies those underlying stressors. Afterwards, the Model of Continuous OSN Usage is developed that emphasizes the importance of OSN-induced stress when deciding, whether or not OSNs are used continuously. The theoretical and empirical analyses offer two major contributions. One, we identify stressors when using OSNs. Two, the effect of stressors on continuous usage is disclosed. These contributions have an impact on three different research domains; research discussing OSNs, technology usage, and techno-stress. Hence, we discuss the influence of the two major contributions for these three research domains.

Stressors while using Online Social Networks

First of all, we develop an OSN-induced stress scale. Therefore, we identify the five distinct OSN-induced stressors of invasion, pattern, disclosure, complexity, and uncertainty. The stressor invasion reflects the increasingly important role of OSNs in daily life and pattern focuses on the need for changing behavioral patterns to the conditions of OSNs, such as the fact that events are coordinated or that OSNs become the predominant communication medium. Disclosure focuses on the information which is revealed in OSNs by the user and all virtual friends. In more detail, users are stressed by perceptions of being forced to disclose all information online and they also report being stressed by checking the latest news frequently in order to stay well informed about all the activities of friends. Complexity addresses the issue that users perceive that they are not able to use all functions of OSNs and uncertainty focuses of technology-related changes. Results indicate that users are particularly stressed due to the invasion of OSNs into daily life and the uncertainty resulting from changes in OSNs. The latter can be explained with the recent changeover to the timeline format of Facebook profiles and constant changes within data protection regulations of the most popular OSN Facebook. The importance of invasion is also explainable when comparing the time OSN was used a few years ago with the time users are online today. In 2008 the average daily use of Facebook was approximately 20 minutes per day (Valenzuela et al. 2009), whereby the latest estimations indicate that this has at least quadrupled over the last three years (Ellison et al. 2011).

Prior researchers investigating behavior in OSNs focus mostly on positive characteristics of OSNs. Among others, Khan et al. (2010) illustrate the possibility to coordinate events via OSNs. A different perspective on OSNs is adopted in this article by including stressors into OSN research for the first time (to our knowledge). As a consequence, we contribute that next to positive characteristics (e.g., Khan and Jarvenpaa 2010) OSNs become a source and symbol of stress. Hence, with the identification of these daily stressors, we confirm the practical observation of Gartner (2011) that the usage of OSNs depicts a source of stress in a theoretical and empirical manner.

We contribute to recent technology usage research regarding the distinct patterns in voluntary and mandated usage settings (Venkatesh and Brown 2001; Venkatesh et al. 2003), whereby recent research has solely revealed different stressors in mandated work-related contexts (e.g., Ragu-Nathan et al. 2008; Tarafdar et al. 2010; Ayyagari et al. 2011; Barley et al. 2011). In such mandated settings, individuals have to deal with these technologies, independently from the question of whether they are strained or not by them. In contrast to that, OSNs are used in a voluntary setting because users can stop using them at any time or reduce their frequency of usage. In summary, this research completes the understanding of stressors in both mandated and voluntary technology usage settings.

Furthermore, stress-related work discusses distinct sources of stressors. Next to stressors resulting from major life events, such as a divorce, the death of a close friend, or the birth of a child, minor daily hassles are identified as sources of stress. These can be understood as irritable events in everyday life that when accumulated result in perceptions of stress, which are, in the long run, more influential than major life events (Helms and Demo 2010). Based on this, recent research has called for investigations into minor daily stressors (Song et al. 2011). The current research can be seen as a response to this specific call because we discuss and disclose minor daily technology-related stressors.

The Influence of Stressors on Continuous Usage

Five stressors are discussed in the Model of Continuous OSN Usage. This model incorporates these stressors and perceptual beliefs, which have been emphasized in voluntary technology usage settings (Venkatesh and Brown 2001) and online social network research (Khan et al. 2010; Krasnova et al. 2010), into Post-Acceptance Model (Bhattacherjee 2001). The resulting model identifies which and how beliefs influence the continuous usage intention and satisfaction with OSNs. First, the model suggests utilitarian outcomes, hedonic outcomes, perceived difficulty of use, and the stressors as significant antecedents of satisfactions. Besides, satisfaction, utilitarian outcomes, social outcomes, and the stressors are direct influencing factors for continuous usage intention. It is quite striking that solely utilitarian outcomes and the stressors have significant effects on both satisfaction and continuous usage intention. In contrast, hedonic outcomes only have an impact on satisfaction, so that users who are gaining pleasure from OSNs are highly satisfied but do not intend to use them continuously for this reason. The same phenomenon is visible for perceptions concerning the difficulty of use. Difficulties are reflected in low satisfactions but the intention to use OSNs continuously is not affected. Otherwise, expected social outcomes have no influence on satisfaction but on the continuous usage intention.

These results imply that for online social network providers they have to consider several – partially different – beliefs when intending to keep user satisfactions and continuous usage intentions high. Nevertheless, results indicate that providers of OSNs have to try continuously to stress out utilitarian outcomes, such as the easy way to stay in contact with friends, and to reduce perceptions of different stressors. Hence, we contribute to online social network research into which perceptions influence satisfaction and continuous usage intention most strongly.

Prior research in the stream of continuous technology usage has studied the influence of distinct perceptual beliefs (e.g., Bhattacherjee 2001; Liao et al. 2007; Chiu and Wang 2008; Lankton and McKnight 2012) but no article has discusses the influence of stressors. By identifying stressors as major influencing factor of satisfaction and continuous usage intention, we contribute the importance of stressors to technology usage research when studying continuous usage. This result might be seen as a response to the call of Brown (2008) who motivates research examining factors influencing usage behavior of OSNs as well as its consequences.

Furthermore, work-related techno-stress research approaches, document that stressors have behavioral and psychological consequences (Tarafdar et al. 2010) which are reflected in reduced satisfactions,

performances, or increased turnover intentions (Ragu-Nathan et al. 2008; Tarafdar et al. 2010). Both types of consequences are also influenced by stressors in voluntary usage settings, whereby we concentrate on reduced levels of satisfactions and continuous usage intentions, as these seem to be the most appropriate variables in voluntary usage settings. In summary, we indicate that stressors have behavioral and psychological consequences in both; work-related technology usage (e.g., Ragu-Nathan et al. 2008; Tarafdar et al. 2010; Ayyagari et al. 2011) and voluntary technology usage.

Future Research

In terms of future research, alternate methods, such as laboratory experiments might be reasonable to extend current knowledge. Among others, users' electrodermal activity or level of cortisol (e.g., Riedl et al. 2012) might be measured to examine the effects of the identified stressors with objective data. Another possibility for future research would be the investigation of technology characteristics, which influence the identified stressors when using OSNs. Here, recent research assumes technology characteristics, such as reliability, pace of change, anonymity, or presenteeism (Ayyagari et al. 2011) as antecedents of stressors. Moreover, future research might also investigate differences between OSNs stressors and stressors of other communication media, such as e-mail (e.g., Barley et al. 2011) or smartphones (e.g., Mazmanian et al. 2005). Here, Maier et al. (2012) identify social overload, defined as the experience of the social demands of virtual OSN friends, as an OSN-specific stressor inducing OSN exhaustion. Next to that, Ragu-Nathan et al. (2008) suggest the three technostress inhibitors technical support provision, literacy facilitation, and involvement facilitation. These technostress inhibitors reduce the negative effects of technostress. Based on this, future research should investigate how stressors in the context of OSNs can be reduced.

Limitations

The presented results of our research are limited by several issues. First, we investigate the influence of OSN-induced stress in household settings by means of one specific online social network. Here, Facebook is used as it is the most widely used online social network. Nevertheless, future research might investigate whether the results are also valid for other OSNs. Second, we collect data to one point in time. This means that dependent and independent variables are captured within one survey. Third, the mean values of the five stressors are at first sight relatively low. Nonetheless, recent research focusing on technology-related stress research, such as Ragu-Nathan et al. (2008) or Ayyagari et al. (2011), report mean values of techno-stress creators in work-related settings, which are in the same range. Fourth, this research does not include individual differences (Thatcher and Perrewé 2002). Here, it is conceivable that individuals with certain personality characteristics might react differently to stressors, so that personality plays a moderating role. Fifth, Brown and Venkatesh (2005) include additional perceptual beliefs within MATH, such as declining cost, costs, or secondary sources. Although costs or declining costs seem to not be of high importance when discussing OSNs, it might be possible that secondary sources influence behavior, for example through the TV and newspapers covering stories about OSNs. Hence, future research might investigate this influence. Sixth, the data sample only includes current users of OSNs and excludes past OSN users. This is necessary due to the dependent variable continuous usage intention. In order to question individuals about their intention to use continuously, individuals have to be current OSN users. Nevertheless, this means that, among other things, the mean values of OSN stressors can be different when including past users.

Conclusion

This research validates practical observations that OSNs are a source of stress (Gartner 2011). Five different stressors when using OSNs are identified: invasion, complexity, uncertainty, pattern, and disclosure. Our Model of Continuous OSN Usage suggests that these stressors have a high impact on satisfaction and continuous usage intention.

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Appendix

Table 7. Exploratory Factor Analysis on Set 1 (451 Cases)

Rotated Component Matrix - 'OSN-induced Stress' Scale

Construct	Label	Component 1	2	3	4	5
OSN-Pattern	P-1				0.649	
	P-2				0.781	
	P-3				0.645	
	P-4					
OSN-Invasion	I-1				0.559	
	I-2			0.834		
	I-3			0.876		
	I-4			0.727		
OSN-Complexity	C-1		0.735			
	C-2		0.768			
	C-3		0.726			
	C-4		0.787			
	C-5		0.834			
OSN-Disclosure	D-1	0.700				
	D-2					
	D-3	0.724				
	D-4	0.877				
	D-5	0.883				
OSN-Uncertanty	U-1					0.842
	U-2					0.906
	U-3					0.791
	U-4					
EIGENVALUES		5.927	4.107	2.073	1.648	1.189

Extraction Method: Principal Component Analysis.
Rotation Method: Varimax with Kaiser Normalization.
Rotation converged in six iterations.

P-4, I-1, D-2, U-4 are deleted; Factor cross loadings below 0.4 are not shown

Table 8. Assessing Reliability and Construct Validity of the new Items – Step 3 (57 individuals)

Construct	Label	ONS-Pattern	ONS-Invasion	ONS-Complexity	ONS-Disclosure	ONS-Uncertanty
ONS-Pattern	P-1	66.7%	10.5%	0.0%	3.5%	0.0%
	P-3	70.2%	3.5%	0.0%	1.8%	0.0%
	P-4	84.2%	5.3%	3.5%	1.8%	0.0%
ONS-Invasion	I-1	21.1%	66.7%	1.8%	0.0%	0.0%
	I-3	8.8%	64.9%	0.0%	14.0%	0.0%
	I-4	5.3%	78.9%	0.0%	5.3%	0.0%
ONS-Complexity	C-1	0.0%	0.0%	80.7%	1.8%	8.8%
	C-3	0.0%	1.8%	80.7%	3.5%	3.5%
	C-4	1.8%	5.3%	82.5%	0.0%	3.5%
	C-5	5.3%	1.8%	80.7%	0.0%	5.3%
ONS-Disclosure	D-1	7.0%	1.8%	5.3%	75.4%	1.8%
	D-3	5.3%	5.3%	0.0%	71.9%	0.0%
	D-4	5.3%	3.5%	0.0%	73.7%	0.0%
	D-5	3.5%	0.0%	0.0%	80.7%	0.0%
ONS-Uncertainty	U-1	3.5%	5.3%	1.8%	0.0%	87.7%
	U-2	0.0%	0.0%	0.0%	1.8%	91.2%
	U-3	1.8%	0.0%	3.5%	0.0%	89.5%
No item has to be removed						

Table 9. Measurement Items[3]

Item	Question
Utilitarian Outcomes	Using OSNs are useful to stay in contact with friends.
	Using OSNs are useful to communicate with friends.
	Overall, using OSNs are useful.
Hedonic Outcomes	OSNs include a wide range of applications, which fulfill the purpose of pleasure.
	I enjoy playing online games in OSNs.
	Overall, I enjoy using OSNs.
Social Outcomes	Using OSNs increase my image.
	Using OSNs enhance my social standing.
	Using OSNs are a status symbol.
Social Influence	People influencing my behavior think that I should use OSNs.
	People influencing my behavior expect me using OSNs.
	People, who are important to me, think that I should use OSNs.
	People, who are important to me, expect me using OSNs.
Perceived Difficulty of Use	It is difficult to understand how to use OSNs.
	OSNs are ease to use (reverse coded).
	Overall, using OSNs are difficult.
Disconfirmation	My experience with using OSNs were worse than what I expected.
	A plenty of expectations from using OSNs remain unfulfilled.
	Overall, most of my expectations from using OSNs were confirmed (reverse coded).
Satisfaction	Using OSNs are absolutely delighted
	Using OSNs are very pleased.
	Using OSNs are very contented.
	Overall, I am satisfied with using OSNs.
Continuous Usage Intention	I intend to continue using OSNs rather than discontinue their use.
	My intentions are to continue using OSNs than use any alternative Social Media.
	If I could, I would like to discontinue my use of OSNs (reverse coded).
Stressors	are included in Table 2

[3] Facebook is used in this study as an example of OSNs